

*Rec'd in AppH
3-26-65*

Statement of

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*NASA
BLOG*

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION *J*

before the

Committee on Aeronautical and Space Sciences
United States Senate

March 22, 1965

Mr. Chairman and Members of the Committee:

Thank you for this opportunity to appear on behalf of S. 927, which covers President Johnson's request for authorization of funds for the National Aeronautics and Space Administration for the Fiscal Year 1966. The President's request is for a total of \$5,260,000,000 with \$4,575,900,000 allocated to research and development; \$609,400,000 allocated to administrative operations, and \$74,700,000 allocated to construction of facilities. The allocation of \$4,575,900,000 to research and development is \$212,306,000 more than the funds approved for these purposes for Fiscal Year 1965 and \$649,900,000 more than the amounts approved for Fiscal Year 1964. The funds requested for the Gemini program show a decrease of \$66,300,000 and the funds requested for the Apollo project show an increase of \$390,607,000 over the funds for these programs for Fiscal Year 1965. These increases for

Apollo within the budget total are largely made possible by decreases in the construction of facilities program from \$262,880,000 in 1965 to \$74,700,000 in 1966. The area of space science and applications includes an increase of about \$47,000,000 for space science work and an increase of about 21.5 million for the application of space technology for communications and weather forecasting. There is an increase of almost \$7,000,000 in aeronautical research and the materials related to it to be carried out in the various NASA centers and by industry. Overall, the in-house and out-of-house aeronautical research activities of NASA are supported in this budget by authorization requests amounting to some \$108,000,000.

President Johnson, in his budget message, characterized the 1966 requests as reflecting "hard decisions and difficult choices." He stated that "It provides for what we must do, but not for all we would like to do."

Among the hard decisions and difficult choices which had to be made in the preparation of this budget was the decision to terminate the programs to develop the M-1 large liquid hydrogen fueled engine, the large 260-inch solid propellant motor, and the SNAP-8 nuclear electric power supply. The

reduction in the requests for space technology activities amounting to about \$48,000,000, when compared with Fiscal Year 1965, results mostly from these terminations. However, as this Committee knows, there is pending before it notification of a plan to reprogram \$16,950,000 of 1965 funds so that these projects can be carried forward into 1966 to appropriate developmental points at which important segments of the engineering data for which the projects were originally planned can be obtained for incorporation in our total bank of technological and engineering knowledge.

From an overall standpoint, the Fiscal Year 1966 Budget submitted by the President represents an acceptance of the levelling-off of the NASA program at the five and a quarter billion dollar level approved by the Congress in Fiscal Year 1965, which in turn followed the reduction of \$600,000,000 from the 5.71 billion recommended by President Kennedy for Fiscal Year 1964. In this budget, the President has accepted this level as more appropriate for this year than the higher level recommended last year and in 1964. This is in recognition of the fact that the NASA operating plan has necessarily been adjusted to the actual level of appropriations for Fiscal Years 1964 and 1965. These funds are now providing a steady stream of systems and components flowing from a rapidly

filling pipeline into an extensive testing effort under conditions which simulate the space environment. Our testing effort will utilize the large complex of facilities which have been brought into being through our construction of facilities programs over the last several years. The requirements of this testing program, the careful measurement of the performance of these large and complex systems against the design and specification requirements, the identification of the causes of any deviations and the feeding of this information into a process which will ensure that the manufacturing lines for the flight equipment, now forming, will deliver in another year or two the kind of reliable flight hardware we need can hardly be characterized by a better adjective than "massive." The President has provided the entire NASA request for the funds in the areas of supporting research technology and environmental testing to achieve this objective. The increase of \$390,607,000 in funds for the Apollo program is indicative of his strong desire, even within the confines of a limited budget, to preserve the opportunity we still believe we have to accomplish the lunar landing and exploration with men within this decade. The margin of insurance built into the original program has largely disappeared, but there is still an opportunity under this budget to accomplish this objective.

The implications which will flow from the successful completion of the ground testing program, which requires such a large proportion of the funds for the Apollo project for Fiscal Year 1966, may be illustrated by the fact that 132 Atlases had been flown before John Glenn took off into space on an Atlas. Forty Titan II's have been flown as of today and give us some statistical basis for confidence in the success of the flight which we expect to launch tomorrow, carrying Astronauts Grissom and Young. But in the case of the Saturn I-B, there will be no statistical basis in terms of completed flights. Men will fly on the third or fourth flight and the same will be true for the much larger and more complex Saturn V. The substitute for the accumulated experience and flight testing, that was achieved in the case of Atlas and Titan, is the use, from the very beginning, of a carefully controlled design, manufacturing and testing system under which all components and all systems are as fully tested as possible under simulated conditions with the most careful configuration control of every change needed and computer storage of all data required to apply judgment at the critical points of decision in connection with launches. For anyone who thinks this is not a grave responsibility, let me point out two facts: First, the amount of energy contained in the propellant

aboard the Saturn V Apollo-LEM system will be 100 times the amount which provided the spectacular fireball which emanated from the exploding and burning Atlas-Centaur a few days ago. Second, with something like 50 thousand items to be checked and rechecked before launch in connection with the Saturn V Apollo-LEM combination, this must be accomplished automatically with no human being nearer than 2 miles, except the three men riding in the nose of the rocket.

As I advised this Committee during our posture hearings, the NASA system of management has efficiently mobilized for research and development in aeronautics and space some 400,000 men and women and is utilizing some 20,000 industrial companies under prime and subcontract arrangements. We are handling about 250,000 procurement actions per year and over 150 universities are involved in the scientific, engineering, and training programs required to spread the out-in-front problems over the largest number of able minds under conditions conducive to achieving as rapid progress as possible towards solution.

The operating plan on which this budget is based involves the continuation beyond 1966 at about the five and a quarter billion dollar level for another year or two, the exact time

dependent on the success we have in our massive testing program and in the proof of the results through the early flight tests of the Saturn I-B and the Saturn V. Our work to date gives us somewhat more confidence than we had a year ago that at this level we can carry out the missions which were planned in 1961, but it is important to keep in mind the caution that we are just now ready to find out how men can live, work, remain efficient, and make important contributions in the harsh environment of space for more extended periods than in the Mercury program. Statements of the confidence we feel today will mean little if the Gemini-Titan flight system does not turn in the predicted performance tomorrow. And if this flight system functions perfectly and gives us experience for periods up to 2 weeks within the next year, we still must await that experience to have a firm foundation for basing our future activities. Our present plans are based on the assumption that weightlessness for relatively limited periods will not harm or degrade the performance of an astronaut. With all our careful work, from which we can say we have developed increased confidence, the unknown still looms large and the risks in the use of the rocket that Dr. Dryden has called "not a perfected device" are still large and should not be minimized.

A part of the hard choices in the setting of priorities which the President has stated underlie this budget relates to those projects we feel confident we could bring into being on a time scale to fit in behind the periods for which the current programs will require the level of five and a quarter billion dollars.

For all those interested in the future of aeronautics and space, it is important to note that President Johnson has included in his request funds to initiate more detailed studies of the Earth-Sun relationships through an Advanced Orbiting Solar Observatory, and has included funds to do the necessary planning to enable contracts to be let under the 1967 budget for a Voyager mission to Mars in 1971. He has included funds for studies related to the use of the Apollo-LEM combination, with both the Saturn I-B and the Saturn V, in the period following the lunar landing and the development of the capability to operate with these equipments with man out as far as the Moon. He has also included funds for continued advanced aeronautical research on propulsion systems that will be needed for large supersonic aircraft engines and for research tests of hypersonic propulsion up to a Mach number of 8. Funds are included for joint activities under which the United States Air Force and NASA will work together

to learn what we both need to know from the large supersonic B-70 models now available for flights to complete the envelope of knowledge needed by both the military services and NASA. The Federal Aviation Agency is kept closely and continuously informed of these activities.

In summary, Mr. Chairman, the funds appropriated to NASA in previous years have laid a foundation for preeminence in space -- through the increasing efforts of outstanding scientists, researchers, engineers, and scientific and engineering teams at a large number of universities; through the utilization of contracts with American industry for the application of large resources for advanced research and development; and through the build-up of sufficient in-house scientific, technical and managerial capability to plan, manage and supervise the program. The management of many NASA-funded contracts by the Department of Defense, the handling of large segments of our construction of facilities by the Corps of Engineers, the assignment to NASA of outstanding project leaders and other specialists from the military services, the recruitment of seasoned executives from industry for important management responsibilities, and the cooperation of many other government agencies running all the way from the United States Weather Bureau to the Civil Service Commission have built a foundation

of formidable aeronautical and space capability. The funds requested for Fiscal Year 1966 will continue and perfect this pattern for the development of national technological and scientific power.

In spite of what continues to be said by some critics of the program, this is not a crash effort and it is efficiently conducted. It is giving us the ability, as a nation, to have a say in the big decisions that will not only affect us but which will have a large part in controlling the environment within which other nations must work out their own destinies. It is, in my firm view, denying the USSR many of the options and benefits which that nation expected to obtain from its leading position in space.

Because the President has made so many hard choices, I believe your own choice in concluding to support this program will be easier than perhaps it has been in past years.

Thank you very much.
